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REMARKS

Claims 1-65 are pending in the instant application after this amendment adds new claims 63-65. Claims 1, 11, 17, 18, 22, 33, 43, 48, 49, and 58 are amended by this amendment. No new matter is added by the amendments and new claims, which find support throughout the specification and figures. In particular, the amendments and new claims are supported in the specification at least at page 12, lines 21-26 and page 6, lines 13-25. In view of the amendments and the following remarks, reconsideration and allowance of the instant application are respectfully requested.

Applicants note with appreciation that the Examiner acknowledges that claims 11, 22, 43, and 58 are directed to patentable subject matter. Claims 11, 22, 43, and 58 are amended herein to include the features of their respective base claims, and it is therefore respectfully submitted that these claims are in condition for allowance.

Claims 7, 23, 39, and 54 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Applicants respectfully traverse.

Claims 7, 23, 39, and 54 recite the limitation "wherein the plurality of interim-fast-access-time nodes comprise respective location tables" in lines 1-3. The Office Action states that it is unclear how the plurality of interim-fast-access-time nodes comprise tables in light of the Specification, which appears to link the tables to the nodes. However, as is apparent from the Specification, each node includes a table in a memory. Therefore, the tables are associated with the cache nodes (i.e., the interim-fast-access-time nodes). Support for this feature is provided in the Specification at:

Configurations of system 10 that include an all-to-all configuration such as configuration 11 *include track location table 21 in each cache node 20* of the all-to-all configuration. Track location table 21 is used by the cache node to determine an exact disk location of

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a requested LUN and track. Table III below is an example of *track location table 21 for cache node Ca7*, assuming that mapping 28 corresponds to Table I. In Table III, the values a, b, ... , f, ... of the disk locations of the tracks, are allocated by system manager 54.

(Specification; page 17, line 9 to page 18, line 2; emphasis added), and at:

Table VI below is an example of *a table for cache node Ca7*, similar to Table III above, that assumes each track is written to two separate disks 12, thus incorporating disk redundancy into system 10.

(Specification; page 25, lines 14-17; emphasis added). The specific disk locations for each track are assigned by system manager 54. A table similar to Table VI is incorporated as track location table 21 into each respective cache node 20. Therefore, each node includes a table, as recited in the claims, and for at least this reason these claims are allowable.

The reference to claims 18 and 49 does not clearly state a rejection or objection, however, these claims have been amended to clarify that the IO requests *are directed to* one or more interface nodes. It is respectfully submitted that the amended claims are allowable.

Claims 1-6, 8-10, 12-22, 24-26, 28-38, 40-42, 44-53, 55-57, and 59-62 are rejected under 35 U.S.C. 102(a) as being anticipated by United States Patent No. 6,898,666 to Henry et al. (hereinafter referred to as Henry). Applicants respectfully traverse.

Claim 1 is directed to a storage system that includes, *inter alia*, one or more slow-access-time-mass-storage nodes, coupled to store data at respective first ranges of logical block addresses (LBAs), and a plurality of interim-fast-access-time nodes, *configured to operate independently of one another*. Each interim-fast-access-time node of claim 1 is assigned a respective second range of the LBAs and coupled to receive data from and provide data to the one or more slow-access-time-mass-storage nodes having LBAs within the respective second

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range. In amended claim 1, the interim-fast-access-time nodes are configured to be *reassignable* to a further second range of the LBAs.

The Examiner asserts that all of the features of claim 1 are disclosed in Henry. In particular, the Examiner asserts that Henry discloses the interim-fast-access-time nodes of claim 1 by cache pools 1 and 2. (Office Action; page 3, line 8). However, as is apparent from figure 5 and the accompanying description of Henry, the cache pools in Henry are not configured to operate independently of one another. In figure 5 of Henry, cache pool 2 accesses all five disks (Henry; col. 5, lines 9-23). Furthermore, in Henry, two or more XOR operations are performed when the data spans two logical block addresses (Henry; claim 19). Even though each XOR operation is performed on only one cache pool (Henry; col. 4, lines 37-38), with regard to multiple XOR operations, as per claim 19 of Henry, multiple cache pools may need to be accessed (Henry; col. 5, lines 50-52). Therefore, the cache pools in Henry do not disclose or suggest the plurality of independent interim-fast-access-time nodes, as recited in claim 1. Therefore, for at least this reason, claim 1 is allowable.

Additionally, and for the purpose of expediting prosecution, claim 1 has been amended to recite that the interim-fast-access-time nodes *are configured to be reassignable to a further second range of the LBAs*. It is respectfully submitted that Henry does not disclose or suggest this feature, and therefore for at least this additional reason claim 1 is allowable.

Independent claims 17, 33, and 48 include features similar to those discussed above in regard to claim 1, and therefore these claims are allowable for at least the same reasons as claim 1 is allowable.

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Claims 2-6, 8-10, 12-16, 18-22, 24-26, 28-32, 34-38, 40-42, 44-47, 49-53, 55-57, and 59-62 depend from one of claims 1, 17, 33, and 48, and therefore each of these claims is allowable for at least the same reasons as their respective base claims are allowable.

New claims 63-65 depend from claim 1, and therefore these claims are allowable for at least the same reasons as claim 1 is allowable.

Additionally, claim 63 includes the feature that the interim-fast-access-time nodes are configured to be reassigned by a management node. It is respectfully submitted that Henry does not disclose or suggest reassignments by a management node, and therefore for at least this additional reason claim 63 is allowable.

Additionally, claim 64 includes the feature that the interim-fast-access-time nodes are configured to be reassigned based on a failure of one of one or more interim-fast-access-time nodes and one or more slow-access-time-mass-storage nodes. It is respectfully submitted that Henry does not disclose or suggest reassignments based on a node failure. In contrast to the independent node structure of the present invention, if a cache node fails in the device according to Henry, the entire system cannot work. Henry apparently discusses a system that is akin to a single computing device inside which the memory is separated into pieces that work in a fixed way with respect to the disks and the LUNs. In Henry, there is no way to overcome the failure of an individual memory so as to allow the system to continue its normal operation, since the cache nodes are not independent. Therefore for at least this additional reason claim 64 is allowable.

Additionally, claim 65 includes the feature that the interim-fast-access-time nodes are configured to be reassigned based on rebalancing a load between one of one or more interim-fast-access-time nodes and one or more slow-access-time-mass-storage nodes. The flowchart of figure 6 of the present application makes clear that the addition or removal of a cache or disk

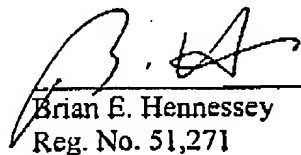
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node from the system causes mapping updates and/or track location table updates to reflect changes in the system. In the methods and systems of the present invention, there is a redistribution step in which the system manager redistributes data on disks or between cache nodes, depending on the whether there has been a disk change or a cache change. (Specification; page 24, lines 8-18). It is respectfully submitted that Henry does not disclose or suggest reassignments based on rebalancing of a load, and therefore for at least this additional reason claim 65 is allowable.

In view of the remarks set forth above, this application is in condition for allowance which action is respectfully requested. However, if for any reason the Examiner should consider this application not to be in condition for allowance, the Examiner is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged to Deposit Account No. 50-1290.

Respectfully submitted,



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